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BOTANICAL GAZETTE.

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## Botanical Papers before the American Association.

The following is a full list of the botanical papers read befor- Section F at the Ann Arbor meeting of the American Associae tion:

J. C. ARTHUR, Proof that Bacteria are the direct cause of the disease in trees known as pear blight.

CHARLES R. BARNES, The process of fertilization in Campanula Americana.

CHARLES E. BESSEY, The question of bisexuality in the pond-scums (Zygnemaceæ); also, Further observations on the adventitious inflorescence of Cuscuta glomerata.

T. J. BURRILL, The mechanical injury to trees by cold.

D. H. CAMPBELL, The development of the prothallia of ferns.

JOHN M. COULTER, On the appearance of the relation of ovary and perianth in the development of dicotyledons.

W. G. FARLOW, Notes on some injurious fungi of California.

E. LEWIS STURTEVANT, An observation on the hybridization and cross-fertilization of plants; also, Germination studies.

Mr. Arthur's paper, published in full in this number, excited a good deal of interest, dealing as it did with a subject coming into greater and well-deserved prominence. Prof. Burrill, who had been the first to announce bacteria as the cause of pear-blight, expressed very great satisfaction in Mr. Arthur's results, which proved so directly a view for which he had been for some time contending.

The paper by Professor Barnes, also printed in this number, brought up some recondite facts in the process of fertilization which it would be well for all teachers, at least, to know. The wonderful results of the methods of the German laboratories are in no place better seen than in this whole subject of reproduction. Not the least valuable part of Professor Barnes' paper is his explanation of methods used in obtaining such delicate results.

Professor Bessey, by means of a series of observed forms, showed conclusively that filaments of *Spirogyra* can not be called male or female, as the two functions seem to reside indifferently in the conjugating filaments. The so-called "lateral," or better, "endwise," conjugation, also prevents any thought of a male or female filament. The subject seemed to be of great interest, as touching upon the beginnings of bisexuality. It was suggested by some, in the discussion that followed, that, inasmuch as it is far more common to find in conjugating filaments one entirely empty and the other containing all the zygospores, while the cases observed by Professor Bessey are really exceptional, the plant might be one in which bisexuality is attempted but not yet completely worked out. To others it seemed preferable to consider not the filaments, but the cells as individuals which are perfectly bisexual; while an intermediate view was held, which regarded both the former as right, for *Spirogyra* is a plant which marks not only a first attempt at bisexuality, but in addition to this, bisexuality in groups of individual cells, thus approaching the higher composite individual.

Professor Bessey's second paper was the result of a further study of the adventitious inflorescence of *Cuscuta glomerata*, announced at the Philadelphia meeting. It seems that the flower branch develops from the stem endogenously, while the hold-fasts begin exogenously. These adventitious buds occur only at points of root connection with the host, and a section shows that the plant axis is changing in the direction of the new buds, the old stem presently dying off below. Not only is a new plant axis formed, but for a time at this transition stage the leaf scales contain chlorophyll.

Professor Burrill spoke of two mechanical effects of cold upon trees; the radial splitting of wood and bark, and the separation of bark or wood layers in a concentric way. The first was explained by water freezing in plates parallel to the surface of an organ, and then additions being made to the base, crystals perpendicular to the surface would be formed. Thus the wood contracting, and the ice expanding tangentially and longitudinally (chiefly the former), radial bursting is the result. The south side of a tree is the weakest, as more water exists there, and ice is first formed. Direct observation shows that the specific gravity of sap is greater on the north side of a tree.

Concentric splitting, usually called "wind-shake," was explained by minute ice crystals forming with axis perpendicular to the wood cylinder, thus causing radial tension. Want of ripeness of tissues, in the sense of the relation of water to other constituents, is the chief predisposing cause.

Mr. D. H. Campbell, whose paper appears in this number, in addition to his interesting anatomical study, is to be commended for pointing out the ease with which fern prothallia may be cultivated. These, too often considered material to be obtained with great difficulty, can be cultivated with no trouble. Suggestion was made that such culture afforded a good opportunity for experimenting upon the hybridization of ferns.

Professor Coulter's paper, published in this number, was more in the form of an announcement than a formal paper following completed work. It was readily agreed to by all, in the discussion that followed, that any attempted natural classification of Dicotyledons was better than the artificial one so long in use, and that organogeny might prove as successful in plant classification as embryology among animals.

Following Dr. Farlow's paper, also published in this number, Mr. J. C. Arthur remarked that the hollyhock disease was one of great importance. It was introduced into Europe in 1869, and its progress has been carefully mapped. It has spread rapidly and surely over almost the whole continent. Statements to the effect that this disease had appeared in the United States have been made in various places, but the true hollyhock disease does not exist in this country; the fungus mistaken for it being the same form found by Dr. Farlow, which also occurs in Kansas and New Mexico. The disease is interesting in view of its possible relation to our cotton crop. By Mr. Arthur's suggestion and aid Mr. C. B. Plowright has made various attempts to communicate the disease to cotton plants, but without success. Prof. C. E. Bessey reported the same *Puccinia*, found by Dr. Farlow, on specimens of *Malvastrum* and *Callirrhoe* from Dakota.

Dr. Sturtevant, in his observation on the hybridization and cross-fertilization of plants, used beans and corn as examples, also barley, peppers, squash, etc., and showed that where pure forms are crossed intermediate forms rarely occur. Prof. E. D. Cope, in commenting favorably upon the paper, confirmed the statements, to some extent, from his own experience.

In Dr. Sturtevant's germination studes, Christiana melon seed and Danvers yellow onion were germinated, showing considerable variation in percentage of duplicates; also the germination at low temperature. Prof. Beal spoke of the germination of seeds that had been buried below frost for some time.

It was very evident that botanists were bestirring themselves to take a more prominent place in Section F. At Buffalo we expect to see still further evidence of this awakening, not only in the number of papers presented, but chiefly in the care shown in their preparation.

## The Botanical Club of the A. A. A. S.

The attendance at Ann Arbor was much larger than its most sanguine friends had anticipated, there being eighty-five names entered upon the register. This gave the club twenty-three and one-third per cent. of the total attendance of the association, more than twice as great a proportion as heretofore. Thirty-seven of the members recorded the department of botany in which they are the most interested. These were entered under twenty different headings, but may be reduced to four, as follows: flowering plants and ferns, nineteen; cryptogams, fourteen; physiology, four; and paleophytology, two.

Six sessions were held in all—four in the morning and two in the afternoon—each an hour long, all in the room of the biological section, with the exception of the one on Friday evening, which, by invitation, was changed to Professor Spalding's botanical laboratory. The numbers present at the sessions exceeded seventy-five for several and dropped the lowest at the laboratory gathering, when there were only twenty-eight.

The papers, notes and discussions were of just the kind for which the club was specially founded. Those who heard them can not but have received much valuable information applicable to personal work, as well as having the pleasure of listening to the results of recent studies. The resumé which follows is necessarily very brief, and often omits the items which the listener may have found the most directly serviceable for his own needs.

THURSDAY, August 27, 9 A. M. The chairman made several suggestions of topics for the consideration of the club, which he had already formulated in the last number of the *American Naturalist*: 1. The necessity of uniformity in the use of English names of plant diseases and of the fungi producing them. 2. The advantage of uniform pronunciation of the Latin names of plants. 3. The distribution of botanical literature among the several journals so that each shall represent only certain departments of the science. 4. The relations of the botanists of the country to the National Herbarium at Washington.